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HISTORY OF AN OUTBREAK OF OPHTHALMIA IN A GOOD CLASS BOARDING SCHOOL, WITH REMARKS.

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RECORDS have often, from time to time, been made of epidemics of ophthalmia affecting institutions, but these have, generally speaking, if not always, been those of pauper or low grade schools. A history of an epidemic implicating the boys attending a school not far removed from a public school, cannot, perhaps, fail to be of interest, especially as there are many points connected with it which may be of service to any having to deal with such an outbreak in the future.

When the discussion took place at the Ophthalmological Society a short time since, it was premature, in the opinion of those who had seen most of the outbreak, to discuss the matter, and it was further feared that it might be prejudicial to a school which had already suffered sufficiently. These were, at all events, the reasons which prevented my contributing to the discussion what is here written. Now that the epidemic is practically over, its history can be given with the cordial co-operation of the medical officers, Drs. Jalland and Evelyn, who have borne the brunt of a very anxious time, and with the knowledge of the school authorities, who can only gain by having set forth the care, regardless almost of expense, with which they have endeavoured to discharge their duty.

Towards the middle of August, 1893, I became aware, in consequence of one of the boys being brought to me, that the scholars at a school in Yorkshire were, or at least some of them, suffering from an affection of their eyes. The boy in question had been among these. His condition was similar to that which will be mentioned presently as being found in the others.

Shortly after this I was requested to inspect the school and the boys, in concert with my friends Drs. Jalland and Evelyn, the medical officers to the school. This I accordingly did, and on the evening of August 23rd we inspected the school premises and examined several of the boys. The next day we examined the remaining scholars. The visits were thus arranged to not only give ample time for a

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thorough inspection of the school and boys, but for a complete discussion of the outbreak with the medical officers. The condition of things found and the circumstances which led up to their prevalence in the school may be thus stated.

In the preceding April (16th) a boy was taken to Mr. Jalland, suffering from ophthalmia. Other cases were at this time noticed, and were isolated as they arose; the boys being transferred to a house which is reserved for those affected with any infectious disorder. The eyes were bloodshot, but with little perceptible discharge. Several boys at one time or another suffered in a similar way; perhaps thirty altogether were affected. They did, however, to all appearances recover quite well.

It was at this period believed that one or two of the boys brought the disease into the school, but in the light of subsequent events it may be doubted whether this was the case or whether one or the other was merely the first to show evidence of the affection.

After the occurrence of ophthalmia in this way, the time was drawing on for the dispersion of the boys for the vacation, it being one of those schools which adhere to the old-fashioned system as to holidays. In consequence also a good deal of the prevalence of influenza they were sent home a week earlier. This would be in the middle of June. On their reassembling in the early part of August, Mr. Jalland soon detected what he considered an unhealthy condition in some of the boys' eyes, and had them again isolated. It was in great part owing to his representations of the necessity of an examination of the whole of the boys that I was requested to co-operate. It should be added that some of the masters had been sufferers at the same time as the boys.

As the result of the examination it may be said broadly that a mild form of follicular conjunctivitis was found to be very prevalent. The vesicles were situated chiefly on the inner surface, which was also reddened, of the lower eyelid, in some cases running the greater part of the length of the lid, like a chain of pearls. In but a few cases was the retro-tarsal fold much involved. The upper lids were less affected; when they were they had lost their polish, and appeared often velvety, or in some instances as if the finest sand had been sprinkled on the surface; there was also in some cases an increased vascularity. There appeared in all an absence of perceptible discharge. No discomfort was complained of, and without everting the eyelids hardly a case presented anything abnormal. Altogether eighty-four boys were examined. With the exception of two, all were boarders, and comprised the entire number of pupils at the school. One of the new boys was perhaps the most affected of any that were seen, and it appeared almost certain that he had entered with the condition present. Of the whole number of the boys, there were thirty-eight (Class 1, or healthy) who could be regarded as healthy, but there were as many as thirty-nine (Class 2, or suspicious) whose eyes, though not in many cases showing any very marked departure from a normal condition, yet under the circumstances it was impossible to regard as quite well. These cases varied a good deal, and it appeared that some at all events on a subsequent examination would be found to be fit to be placed among the healthy ones. There were seven cases (Class 3, unhealthy) in which the condition was marked. In five the condition of follicles before referred

to and the velvety state of the lids were very distinct. In no case, however, could we make out the presence of what could positively be stated to be sago-grain granulations.

All the boys had a well-cared-for appearance, and evidently were in good health. They were a particularly hearty-looking lot of lads, even for schoolboys, and there was reason for believing that their feeding was neither unsuitable nor stinted.

The school premises were commodious, and on the whole suited for the purposes of a school. Some of the class rooms were quite recently built. The drainage had also in the previous year been overhauled. There were unusually good playgrounds or fields attached to the school.

The sleeping accommodation was carefully gone into. The boys occupied thirteen bedrooms, and the lowest cubic space allowed in different rooms were 506, 518, and 528, whilst others reached as high as 668, 775, and 796, but the greater number had a space of between 550 and 600. Now, though this space may be passed as not inappropriate for healthy lads, it was pointed out that the boys in the condition we found them could hardly be regarded as healthy, and that, therefore, efforts to provide increased cubic space should be made.

The nature of the affection with which we had here to deal will be discussed further on, but it may now be stated that we reported to the school committee that the disease did not then, nor at any time, appear to have assumed an acute or bad form, and that the cases generally had been of an ill-defined type, and their recognition was hardly possible except by examination. The question of the drainage was referred to, and mention was made to the importance of hygiene in the eradication of the affection from the school.

Suggestions in our report were also made under the following heads:

1. A weekly examination of the scholars should for the present be made. This would enable the boys as they recovered to be drafted from one class to the other, and it would lead to the detection of fresh cases, and admit of their immediate treatment.

2. That the boys, as above classified, should be separated in the house for sleeping purposes. As the boys of Class 3 recovered they would pass into the next class (Class 2), rather than going at once for sleeping among those who were believed to be healthy (Class 1).

3. That it was important to make each boy use separate water and towel.

4. The lavatory basins were also recommended for the present to be dispensed with; the boys to use the running water from the tap.

The importance of fresh air and exercise was insisted upon, and the emptying of the school rooms after lessons, and leaving the doors and windows open was advised, so as to let fresh air freely circulate into the rooms.

The treatment generally suggested was for those in Class 2 a boric acid lotion, and for those in Class 3 the same, with chloride of zinc added to it in weak strength. A solution of argent. nit. was ordered also for the worst cases. This was, however, soon discontinued, as it somewhat interfered with the regular school work.

The suggestions as just mentioned were speedily adopted by the committee of the school, who, it is needless to state, were extremely anxious that an epidemic which was calculated to be damaging to the school should be got rid of as quickly as possible. The periodic examination of the boys was with most praiseworthy zeal carried out by Dr. Evelyn. We were in frequent communication, and after a time, in consequence of his arriving at the conclusion that the number of boys affected, instead of decreasing, had become increased, it was arranged that we should again together inspect the whole of the boys.

The inspection of the school was made on the evening of October 27th, and the boys were examined on the morning of the 28th. Moreover, in addition to the boys, the whole household, including teachers, matron, and servants, were examined. This brought the total examined up to 102. Several among the teachers were found afflicted in like manner to the boys. Among the servants also cases were found, and these were invariably among those whose duties took them into the boys' apartments and who were in their work thrown among the boys and their belongings. The healthy were those confined to the kitchen and who were not brought at all into contact with the scholars.

In our report dated October 30th we stated that, notwithstanding the measures that had been taken, the condition of the boys was not as satisfactory as when we had examined them together in August. Thus, taking the boys again in classes as had been done previously, we found that Class 1, or the healthy class, was greatly diminished (13); that Class 2, or the suspicious class was smaller (19); and that Class 3, the affected class, had become decidedly larger (41). This represents the numbers the first week in November when some of the boys had gone to their homes. It was pointed out that the number of boys in the school to whom under the circumstances an absolutely clean bill of health could be given was very small, whilst in those affected the nature of the malady was more characteristic than on the previous inspection. The freedom from discharge which had been noted before was still true at this time. The absence of anything like acute cases was also persistent.

The diagnosis, at all events at the outset, of follicular from true granular ophthalmia is admitted to be difficult, if not impossible. The opinion formed of this outbreak of ophthalmia from the first was that its type was that of simple follicular disorder rather than the more serious granular or trachomatous conjunctivitis. The situation of the follicles chiefly on the lower eyelids, the absence of acute cases, and even in the large number altogether affected, of any implication of cornea however trifling, the freedom in all from appreciable discharge, and the mild character of the affection were all features that lent force to the belief that the epidemic was follicular. It was, however, quite clear that in spite of the little appearance of discharge, cases were proving contagious, or that there were local conditions favourable to the propagation of the disorder, or that both influences were in play.

After careful consideration we decided to recommend the committee to disband the school as soon as practicable, and to adopt means during the boys' absence for the thorough cleansing of the premises. The measures which it had been possible to adopt at the school had been carried out, and now it had become necessary to pursue these methods still further by preventing the crowding together of the boys. Without a radical measure like this it was pointed out that it was to be feared that the affection might get a firmer hold, and become more difficult of eradication. It was called for alike in the interests of the boys and in those of the school. Under even favourable circumstances the disease was often intractable.

Our suggestions were placed under the following heads:

1. That it was desirable to disband the boys as soon as possible. (It was suggested that they should reassemble in the first week in February, thus giving a holiday of ten to eleven weeks.)

2. That each boy should take to his parents a note stating that, although to casual observation his eyes might appear sound, they had, nevertheless, been affected with ophthalmia, and, in the opinion of the medical officers to the school, required treatment for the same.

3. That a boy unfitted to be an inmate of this school was equally unsuitable for admission to any other until the condition of his eyes had been relieved.

4. That no boy should be allowed to return to the school without a satisfactory medical certificate; the same to be forwarded a week before the opening of the school, to enable it to be submitted to the medical officers who had notes of the present condition of each boy, and would know how far the certificate in any given case would meet the requirements.

5. The absence of the boys should be taken advantage of for a thorough fumigation of the establishment, taking away the carpets from the boys' rooms (not to be replaced), the stoving of the bedding, and the overhauling of the ventilation of the bedrooms, etc.

6. The servants should, if it were desirable to keep them on the premises, occupy separate bedrooms after the boys had left. Anyone still showing evidence of the affection should be got rid of some time before the reopening of the school. It was desirable to put the servants under treatment.

This last remark also applied to several of the masters. It was further pointed out that it would be desirable to adopt treatment which would be less incompatible with school work than had hitherto been the case.

It may be supposed that the subject of the boys themselves proving centres of infection to their friends if they returned home was fully discussed before the recommendation to disband the school was made. The absence of discharge prevented us attaching great danger to their doing so. It is, perhaps, a truism that in conjunctival cases the degree of contagion is proportionate to the amount and character of the discharge. It was further to be remembered that each of these boys would at his home occupy a separate bedroom, especially if the matter was suggested to the parents. That the opinion we formed was a correct one has, I think, been proved by subsequent events. Since the period spoken of I have had several boys more or less under my immediate care at their own homes, and yet have not met with cases that have been affected in consequence; nor in those which I have been able to follow elsewhere have I learnt differently. I have inquired also of my friends, and they have given me a similar account. In fact I have, after observation and inquiry, been unable to find an authenticated case in which those who returned to their homes were the means of spreading the disease in their families. In our report we urged the importance of drawing the attention of parents to the condition of the boys' eyes because many were of such a nature that, taken separately, they would readily be pronounced to be free from disease, but, viewed as we saw them collectively at school, their condition was one that called for notice. It was suggested to the committee that by adopting the proposals mentioned, it was quite probable the school would reassemble as usual at the date given.

The school committee were perhaps not unnaturally, it soon appeared, very averse to disbanding the school in the way suggested. In the case of certain boys especially who were preparing for examinations the proposal seemed a hardship. It may be stated that for these, few in number, arrangements could have been made which would not have interfered with the plan being adopted for the school generally. It was, however, decided by the committee to ask the advice of Mr. Jonathan Hutchinson, and this gentleman, who had previously seen one of the boys, visited the school. I understand that after inspecting some of the boys and the school premises, he gave it as his opinion that the affection

was follicular ophthalmia, leading to granular eyelids, that it was propagated by contagion, and that atmospheric and other influences exerted no effect upon it. Further, he deprecated sending the boys to their homes, as they would be sources of infection to their friends, and because it would not be possible to secure proper treatment in their homes. It would be necessary for some of the boys at least to remain over the vacation for treatment.

The committee decided to act upon this advice. It was a matter of regret to me that an opinion so opposite to the one that had only a few days before been given by me in consultation with the medical officers to the school, after repeated examination by us of the whole of the boys, as well as of the other inmates, and after an acquaintance with the whole of the epidemic, should have been given and acccpted without a conference as to the grounds on which our advice had been based over and above the bare statements in my reports.

In a circular issued to the parents the committee at this time represent Mr. Hutchinson as saying, "All parents deciding to remove their boys, either permanently or for the winter vacation, should be informed that however apparently slight the symptoms, it is imperatively necessary that adequate measures be patiently carried out. The disease is very liable to lapse into a chronic form, and it is at all stages contagious. If uncured it may easily cause weakness and irritability of the eyes which may last for years. These considerations are of much weight in support of the recommendation that all the boys affected should remain in the city, where they could have good professional treatment, together with specially adapted methods of instruction. No boy suffering from the disease in any form should be sent to any other school, nor, indeed, be permitted to mix with others without precautions."

From this time my connection with the body of scholars ceased, though up to the time of writing, by means of boys and other inmates of the establishment who have been from time to time under my immediate observation, and through the kind courtesy of my friends Drs. Jalland and Evelyn, my knowledge of subsequent events has been tolerably complete. Recently, also, I have had another opportunity of examining several of the boys and the school premises.

It appears, then, that the division into classes, as mentioned in my reports, was adhered to. Those boys who were well were drafted from the school house into another building, and isolated. Those affected were kept in the old school buildings for treatment, which consisted principally of quinine lotion and applications of solutions of nitrate of silver and chloride of zinc. Many of the boys were at once removed by their parents, and others returned home at the Christmas vacation. At this latter time, those remaining under treatment, about thirty in number, were transferred to Scarborough. An hotel was taken for them; each boy was provided with a separate bedroom, and the treatment was continued. School reopened in the end of January. The new boys, or those who had been at home, went back to the school house. The others remained at Scarborough. Some of the boys who returned from home with certificates were nevertheless rejected by Dr. Evelyn, whose opinion as to their unfitness was fortified by that of Dr. Tempest Anderson, who had from time to time seen several of those affected.

At Scarborough improvement in the boys' condition was brought about. The sea air was distinctly beneficial. If, however, the course I had suggested had been adhered to, it would have been unnecessary, and considerable expense would have been saved.

These divided establishments went on until early in April last, when most of those who had been retained at Scarborough had recovered, and the time had arrived when it was necessary, if possible, to have all the boys once again together. Six of the worst of those left, as well as a new boy, about whose eyes Dr. Evelyn had had some question at one time, were taken to see Mr. Nettleship. He considered them free from contagion at that time, though a certain amount of redness or thickening, or roughness of the conjunctiva might remain for some time to come. He did not, however, think it would be wise, and possibly not safe, to return these, and also the number, nineteen or twenty, who had been at Scarborough, into the body of the school immediately as healthy. They might attend school with the healthy boys, but still sleep separately in a different dwelling, if possible. He advised the continuation of the examination of these boys' eyelids once a week, and the periodical inspection of the healthy boys should be gone on with. He thought that if the measures which had been adopted were continued until the summer holidays, the school would assemble on its normal footing without any isolation of the boys.

The opinion expressed thus by Mr. Nettleship is quite in accordance with that held out by me in association with Drs. Jalland and Evelyn in the early period of the outbreak. An opportunity was also afforded me of seeing these same boys (as well as others), shortly after they had been examined by Mr. Nettleship. I can, therefore, quite concur in the opinion he gave as to their then condition. The state was a widely different one from that observed in the preceding October, and the follicles present were not more than frequently observed in eyes regarded as healthy. In all the boys seen by me then, and at other times, who had recovered, no evidence was visible of cicatrical changes in the conjunctiva, and from first to last there has been an absence of acute cases with a really noticeable amount of discharge, nor have there been any corneal complications. Further, no case has at any time presented to my eyes definite evidence of trachoma. I must take it, therefore, that difficult as it was in the outset to say positively that such a condition as was met with in these boys would not develop into trachoma, yet that later events have justified the opinions expressed by myself and the school medical officers.

Follicular conjunctivitis is often a protracted malady, and Fuchs, whose description of the affection is one of the best with which I am acquainted, remarks[1] that "the follicles ultimately disappear without leaving a trace behind; the disease, therefore, in spite of its long duration, has a good prognosis, in that it is cured without leaving any sequelæ. In this particular follicular catarrh is essentially distinguished from trachoma, which, in its external appearance, bears a great resemblance to it, but which, however, always leaves permanent changes in the conjunctiva."

He further says that "the etiology of follicular catarrh has

[1] *Textbook of Ophthalmology*, p. 47.

not up to this time been established. By some contagion, by others miasm (vitiated air) has been assigned as a cause of the disease, without any certain proofs being brought for either one view or the other."

There are, however, many circumstances connected with this outbreak that merit consideration :—

1. Previously to any known eye trouble many of the boys had been afflicted with influenza, which was also at the same time rife in the city.

2. That ophthalmia was prevalent during 1893 in the city, and that in a girls' school, separate from but with intercommunication with our school (brother and sisters), several were also afflicted, and the school was disbanded.

3. The early cases may (*a*) have been mild instances of ordinary catarrhal ophthalmia, and vesicular conjunctivitis, as has happened before, may have developed therefrom ; I did not myself see the cases at the first outset. (*b*) The early instances need not have been imported, but have been merely an evidence of the prevalence of the disorder, the more marked cases at that time attracting attention.

4. That at the time of and previous to the outbreak, the drains were open in close proximity to the schoolhouse, the city authorities having the streets up for the purpose of a new drainage system. I am informed that people in the city did attribute their ailments to the smells occasioned by these open drains.[2]

5. The absence of any very gross hygienic defects in the school. The washing arrangements with the epidemic once started were favourable to its progress. Ventilation of some bedrooms was defective, and the cubic space allotted to each boy could have been in some instances larger with advantage. In all these internal matters, however, the school would compare well with others. No source of irritation was discovered when looked for in wall papers or paints.

6. That in spite of hygienic measures, separate towels, etc., the disease spread widely, indicating either in spite of the absence of discharge, that infection was playing a part, or that atmospheric agents (miasms) were at work, or both. Removal from the place facilitated recovery, and did not lead to infection in others.

7. That the outbreak, mild in character, unaccompanied by noticeable discharge, or much visible redness, has been of follicular type, and in cases which have recovered no changes in the conjunctiva has resulted.

In addition to these cases many others of the same character from other schools have come under my observation. In one family, a large one, living in a small house, with distinct overcrowding, many members have suffered. They had been to three different schools. From atmospheric or other causes conjunctival troubles in different parts of England appear last year to have been more than usually frequent.

A word as to the kind of treatment. Experience has shown that mild as opposed to more stringent treatment is the better. It was my belief the applications of silver nitrate rather retarded than promoted recovery, as did also other

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[2] The medical officer of health, in his report, May, 1893, speaks of the subsoil as being damp and unwholesome, with but very little natural drainage, and the sewers as liable to being flooded by a rise in the river. Again, he says the inhabitants suffer from those diseases which are characteristic of a damp climate and a cold and unwholesome soil.

like remedies. Fresh air and the best hygienic surroundings were of the first importance. In dealing with such an outbreak, it is desirable to get the boys away from the school premises where they are all associated together. For boys of the class we are dealing with, sending them home as was suggested is, I believe, the right thing to do. In a pauper school it would be different, as, indeed, would be the case if true trachoma had to be dealt with.

I have since inspected the school premises, and ascertained that the committee have adopted the suggestions given in our reports, and have disinfected and fumigated the place. Distemper has taken the place of papers on the walls except in a few places where paint has been used. Altogether the committee have spared no expense to put the school premises into the best possible condition, and have been repaid by a loyalty and *esprit de corps* on the part of the parents and boys of such a degree, that the school has passed through its troubles with, at the present time, little or no diminution in the numbers of its scholars.

My thanks are due to my friends, Drs. Jalland and Evelyn, for much courtesy, and the latter gentleman in particular, on whom the burden has chiefly fallen, has deserved the highest thanks of the school authorities for his skilful and zealous services.